

Successes of gauge theories

- 1) electroweak (arbitrary mixing angle
fermi rates \propto mass)
- a) electron-positron annihilation
circularly polarized effects
with polarized electrons and W
was treated correctly as function
of energy - Sirlin 1978
- Prescott and Taylor.
- b) optical, coherent in atoms like Muon
and Hydrogen.
- c) prediction of charm due to renormalization
of quarks - charged decay like
 $K \rightarrow \mu^+ \nu_\mu$ etc.
- d) ν scattering, ν -electron scattering, proton $\nu + p \rightarrow \nu + p$.
- 2) QED i) $R = \frac{\sigma^+ \sigma^- \rightarrow \text{hadrons}}{\sigma^+ \sigma^- \rightarrow \text{muons}}$
as function of s
- ii) Deep inelastic $e-p$ scattering
detected cross-section, Q^2
dependence, etc.
- iii) jet phenomena. 2-jet / 3-jet
in $e^+ e^- \rightarrow \text{hadrons}$
- 3) SUT - Proton decay.

MP

localizing the photon \rightarrow Compton scattering

$$\frac{h}{m\lambda} \times \sqrt{1-\beta^2}$$

$$= \frac{hc}{E}$$

for photon $E = h\nu$

so localizing $\approx \frac{c}{\nu} = \lambda$
